

WHAT IS CLAIMED IS:

- 1 1. A communication system comprising:
2 transmission equipment that is assigned to a particular origination path, encodes
3 user signals originating at or near the transmission equipment based on the origination
4 path and a particular destination path, and transmits the encoded user signals on the
5 particular origination path;
6 switching equipment that receives the encoded user signals on the particular
7 origination path, routes the encoded user signals at a path level, and transmits the encoded
8 user signals on the particular destination path; and
9 reception equipment that is assigned to the particular destination path, receives the
10 encoded user signals on the particular destination path, and decodes the user signals.
- 1 2. The system of claim 1, wherein the particular origination path is a
2 particular origination beam and the particular destination path is a particular destination
3 beam and the switching equipment routes the encoded user signals at a beam level.
- 1 3. The system of claim 1, wherein the switching equipment is located on a
2 satellite and the transmitting and reception equipment are ground-based.
- 1 4. The system of claim 1, wherein the transmission equipment is assigned to
2 a particular origination path based on geographic location.
- 1 5. The system of claim 1, wherein the reception equipment is assigned to a
2 particular destination path based on geographic location.
- 1 6. The system of claim 1, wherein the switching equipment includes a
2 controller that dynamically re-routes the encoded user signals received from the
3 transmission equipment to alternative switching equipment that receives the re-routed,
4 encoded, user signals, routes the re-routed, encoded, user signals at a user level and
5 transmits the re-routed encoded user signals to the reception equipment.
- 1 7. The system of claim 1, wherein the origination or reception equipment is
2 mobile.
- 1 8. The system of claim 7, wherein the controller dynamically re-routes the
2 encoded user signals when a total number of origination paths and destination paths used

3 in the system exceed or falls below the number of system users by a predetermined
4 threshold or a predetermined system condition occurs.

1 9. The system of claim 8, wherein the predetermined system condition
2 affects the effective communication of user signals within the system.

1 10. The system of claim 1, wherein the switching equipment determines to
2 which destination path an encoded user signal is destined.

1 11. The system of claim 1, wherein the switching equipment is located on a
2 satellite;

3 the transmission equipment encodes user signals and transmits the encoded user
4 signals to the satellite via the origination path; and

5 the reception equipment receives the encoded user signals from the switching
6 equipment on the satellite via the destination path.

1 12. The system of claim 1, wherein the transmission equipment encodes
2 user signals from a plurality of users and transmits the encoded user signals to a satellite
3 via the origination path.

1 13. The system of claim 1, where the reception equipment receives the
2 encoded user signals from the switching equipment on the satellite via the destination
3 path, decodes the encoded user signals, and distributes the decoded user signals to at least
4 one receiving user.

1 14. The system of claim 1, wherein routing information is encoded in the
2 user signals transmitted by the transmission equipment.

1 15. The system of claim 14, wherein the switching equipment uses the
2 routing information to route the encoded user signals to the destination path.

1 16. The system of claim 1, wherein the transmitting and reception
2 equipment use a spread spectrum technique to transmit the encoded user signals.

1 17. The system of claim 1, wherein the switching equipment determines the
2 origination path and destination path of an encoded user signal based on unique path-
3 specific information.

1 18. A communication method comprising:
2 assigning transmission equipment to a particular origination path;

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3 encoding user signals based on the origination path and a particular destination
 4 path;
 5 transmitting the encoded, user signals on the particular origination path;
 6 receiving the encoded, user signals on the particular origination path;
 7 routing the encoded, user signals at a path level;
 8 transmitting the encoded, user signals on the particular destination path;
 9 receiving the encoded, user signals on the particular destination path; and
 10 decoding the encoded, user signals.

1 19. The communication method of claim 18, wherein the particular
 2 origination path is an origination beam and the particular destination path is a destination
 3 beam.

1 20. The communication method of claim 19, wherein routing is performed
 2 based on beam codes encoded in the encoded, user signals.

1 21. The communication method of claim 20, wherein encoding the encoded,
 2 user signals encodes the user signals with beam codes associated with the particular
 3 origination beam and beam codes associated with the particular destination beam.

1 22. The communication method of claim 18, further comprising:
 2 re-routing the encoded user signals received on the origination path to alternative
 3 switching equipment;
 4 receiving the re-routed, encoded, user signals; and
 5 routing the received, re-routed, encoded, user signals at a user level.

1 23. The method of claim 22, further comprising:
 2 monitoring total number of origination and destination paths and total number of
 3 users;
 4 comparing total number of origination and destination paths and total number of
 5 users; and
 6 selectively performing re-routing the encoded, user signals to alternative switching
 7 equipment based on results produced by the step of comparing.

1 24. The method of claim 18, further comprising:
 2 monitoring for occurrence of a predetermined system condition;

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- 3 selectively re-routing the encoded user signals received on the origination path to
4 alternative switching equipment based on results produced by the step of monitoring;
5 receiving the re-routed, encoded, user signals; and
6 routing the received, re-routed, encoded, user signals at a user level.
- 1 25. The method of claim 24, wherein the predetermined system condition
2 affects the effective communication of encoded, user signals.

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